

Important Advances in Clinical Medicine

Epitomes of Progress — Anesthesiology

The Scientific Board of the California Medical Association presents the following inventory of items of progress in anesthesiology. Each item, in the judgment of a panel of knowledgeable physicians, has recently become reasonably firmly established, both as to scientific fact and important clinical significance. The items are presented in simple epitome and an authoritative reference, both to the item itself and to the subject as a whole, is generally given for those who may be unfamiliar with a particular item. The purpose is to assist the busy practitioner, student, research worker or scholar to stay abreast of these items of progress in anesthesiology which have recently achieved a substantial degree of authoritative acceptance, whether in his own field of special interest or another.

The items of progress listed below were selected by the Advisory Panel to the Section on Anesthesiology of the California Medical Association and the summaries were prepared under its direction.

Reprint requests to: Division of Scientific and Educational Activities,
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Glycopyrrolate: A Challenge to Atropine

ATROPINE, a naturally-occurring belladonna alkaloid, is frequently used during anesthesia as the antimuscarinic drug of choice for premedication, for treatment of bradycardia and, in conjunction with a cholinergic drug, for reversal of the effects of nondepolarizing muscle relaxants. Its popularity persists despite several shortcomings. As premedication its short duration of action (1 to 1½ hours when given intramuscularly) often means that the vagal blocking effects have lapsed before induction of anesthesia; its tertiary ammonium structure allows it to readily cross the blood-brain barrier, resulting in unwanted central effects; and the tachycardia and occasional dysrhythmias following intravenous use may be undesirable and potentially dangerous in some patients.

The search for an antimuscarinic agent without the inherent disadvantages of atropine has led to the synthesis of several quaternary ammonium substitutes. Glycopyrrolate (Robinul®) intro-

duced in 1960, has much to recommend its use over atropine in anesthesia and surgical procedures. Its quaternary ammonium, highly polarized structure does not readily permit passage across the blood-brain barrier, resulting in a greatly reduced incidence of central anticholinergic effects. The longer duration of action (four to six hours when given intramuscularly) favors its use as a premedication to protect against vagal reflexes induced by drugs, intubation or surgical manipulations. A significant reduction in gastric volume and acidity compared with atropine serves to protect against serious sequelae of aspiration.

In the reversal of neuromuscular blocking drugs, glycopyrrolate protects as well as atropine against the muscarinic effects of reversal drugs, with less tachycardia and lower incidence of dysrhythmias. When given intravenously, the duration of antimuscarinic action of glycopyrrolate is three to four hours longer than the duration of cholinergic activity of both neostigmine and pyridostigmine. The incidence of all muscarinic complications is decreased.